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Numeracy Self-Efficacy as a Predictor of Mathematics Performance at Margarita K. Yusingco National High School, Division of Surigao del Sur: A Predictive-Correlational Design

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ABSTRACT

This study examined numeracy self-efficacy as a predictor of mathematics performance among junior and senior high school students of Margarita K. Yusingco National High School, Lingig, Surigao del Sur. A quantitative, non-experimental predictive-correlational research design was employed. Using proportionate stratified random sampling, 140 Grade 9 to Grade 12 students were selected from a population of 216, comprising 83 junior high school and 57 senior high school respondents. Data were gathered through an adapted 15-item Numeracy Self-Efficacy Scale covering basic numeracy skills, problem-solving and application, and higher-order mathematical reasoning, while Mathematics grades from the last grading period served as the measure of mathematics performance. Weighted mean, standard deviation, frequency, percentage, Pearson product-moment correlation, and simple linear regression were used. Respondents demonstrated high numeracy self-efficacy across the three domains. Their overall mathematics performance was Satisfactory ($M = 84.29$, $SD = 6.47$). Using 138 complete cases for inferential analysis, numeracy self-efficacy had a very strong positive relationship with mathematics performance, $r = .857$, $p < .001$, and significantly predicted Mathematics grades, $R^2 = .734$, $F(1, 136) = 376.21$, $p < .001$. The regression model indicated that numeracy self-efficacy explained 73.4% of the variance in Mathematics grades. The findings show that learners who possess stronger confidence in their numeracy abilities tend to obtain higher mathematics performance. Mastery-oriented instruction, guided practice, contextualized tasks, constructive feedback, and confidence-building activities are recommended to strengthen both self-efficacy and achievement.

Keywords: *numeracy self-efficacy, mathematics performance, basic numeracy skills, problem-solving, higher-order mathematical reasoning, predictive-correlational design*

INTRODUCTION

Numeracy is a foundational capacity that extends beyond computation to include reasoning, problem solving, data interpretation, decision-making, and the application of mathematical knowledge in daily life. International frameworks increasingly treat numeracy as the ability to use mathematics meaningfully in personal, academic, civic, and workplace contexts. The OECD (2023) placed mathematical reasoning and real-world problem solving at the center of mathematical literacy, while the SEA-PLM regional framework emphasized the importance of foundational number skills for successful progression through basic education (United Nations Children's Fund & Southeast Asian Ministers of Education Organization, 2020).

Despite its importance, mathematics performance remains a persistent concern. In PISA 2022, Filipino learners obtained a mean mathematics score of 355, and only 16% reached at least Level 2 proficiency, indicating that most learners had difficulty applying mathematics even in relatively simple situations (OECD, 2023). Earlier national evidence also identified substantial mathematical literacy difficulties in the Caraga Region. These patterns show that instructional exposure alone does not fully explain achievement differences and that learner-level motivational variables deserve systematic examination.

One such variable is self-efficacy, defined by Bandura (1997) as an individual's belief in the capability to organize and execute actions required to attain a desired performance. In mathematics, self-efficacy concerns learners' judgments about whether they can successfully complete particular mathematical tasks. These beliefs influence the tasks learners choose, the effort they invest, their persistence when difficulties arise, and their emotional responses to challenging work. Usher and Pajares (2009) further explained that mastery experiences, social persuasion, vicarious experiences, and affective states shape mathematics self-efficacy.

A substantial body of research links stronger mathematics self-efficacy with better performance. Pajares and Miller (1994) found that task-specific self-efficacy directly influenced mathematical problem solving, while Talsma et al. (2018) demonstrated reciprocal effects between self-efficacy and academic performance over time. More recent large-scale evidence showed that mathematics self-efficacy remained a robust predictor of achievement across grade levels (Yang et al., 2024). These findings suggest that confidence is not merely a consequence of good grades; it can also contribute to the behaviors and persistence that support achievement.

The relationship is particularly relevant in the Philippine and local contexts. Filipino studies have generally shown that students with stronger mathematics-related self-beliefs achieve better academic outcomes (Cuevas & Berou, 2016; Dela Cruz & Dela Cruz, 2022; Santos et al., 2022). Within Caraga and the broader Surigao del Sur setting, emerging evidence has likewise linked mathematics confidence, self-perception, and self-efficacy with achievement (Apa & Antiquina, 2025; Cayetuna & Consigna, 2025; Lim & Paceño, 2026). At the same time, division memoranda on the Rapid Mathematics Assessment indicate a sustained institutional need to diagnose learning gaps and design evidence-based interventions (Schools Division of Surigao del Sur, Department of Education, 2024a, 2024b).

Margarita K. Yusingco National High School serves learners from junior and senior high school who differ in mathematical experiences, confidence, and performance. Although school grades indicate how learners perform, they do not fully explain why students exposed to similar curricular conditions obtain different outcomes. The present study therefore examined the level of numeracy self-efficacy in basic numeracy skills, problem-solving and application, and higher-order mathematical reasoning; described students' mathematics performance; determined the relationship between the variables; and tested whether numeracy self-efficacy significantly predicted Mathematics grades. The findings were intended to provide a basis for confidence-sensitive instruction, targeted intervention, and school-based numeracy support.

Literature Review

Numeracy Self-Efficacy and Social Cognitive Theory

Bandura's (1997) social cognitive theory provides the central explanation for numeracy self-efficacy. Self-efficacy beliefs are judgments of capability rather than general feelings of self-worth. Because these beliefs are task- and context-specific, a learner may feel confident in routine calculation but less capable in interpreting graphs, applying formulas, or solving unfamiliar multi-step problems. This specificity makes self-efficacy especially useful for explaining variation in mathematics performance.

The four principal sources of self-efficacy are mastery experiences, vicarious experiences, social persuasion, and physiological or affective states (Usher & Pajares, 2009). Successful performance strengthens confidence, whereas repeated difficulty may weaken it. Observing peers succeed, receiving credible encouragement, and learning to manage anxiety can also influence students' judgments about their mathematical capability. Schunk and DiBenedetto (2020) emphasized that these beliefs interact with goals, self-regulation, and classroom conditions to shape motivated learning.

Evidence consistently identifies mathematics self-efficacy as an important correlate and predictor of achievement. Pajares and Graham (1999) found that task-specific self-efficacy predicted mathematics performance among students entering middle school. Talsma et al. (2018) showed that achievement and self-efficacy reinforce each other over time, while Street et al. (2024) concluded that mathematics self-efficacy is closely associated with learning behavior and performance. These findings support the use of numeracy self-efficacy as an explanatory variable in a predictive-correlational study.

Confidence in Basic Numeracy Skills

Basic numeracy skills include whole-number operations, multiplication and division, fractions, decimals, percentages, ratios, proportions, estimation, and rounding. Although these skills are often described as foundational, students' confidence in performing them cannot be assumed. Routine tasks provide repeated opportunities for mastery experiences, and successful completion may establish an early sense of competence that influences later engagement with mathematics.

Bandura and Schunk (1981) demonstrated that proximal goals improved children's self-efficacy and mastery of subtraction. Throndsen (2011) similarly found that perceived self-efficacy was associated with strategy use and performance in basic addition and subtraction. Koponen et al. (2021) later showed that integrating explicit self-efficacy support with calculation strategy instruction improved the confidence of learners who experienced calculation difficulties. These studies indicate that basic numeracy confidence can be strengthened through structured success, feedback, and strategy instruction.

Philippine evidence supports the same pattern. Santos et al. (2022) found that self-efficacy significantly predicted number-sense competence among junior high school students. The result is important because number sense, estimation, proportional thinking, and judgment of numerical reasonableness closely resemble the basic numeracy skills examined in the present study. These findings suggest that low confidence in foundational tasks may limit persistence even before learners encounter more complex mathematics.

Problem-Solving and Mathematical Application

Problem-solving self-efficacy refers to learners' confidence in choosing appropriate operations, interpreting information, applying formulas, checking solutions, and explaining mathematical reasoning. These tasks require more than memorized procedures because students must understand a problem, select a strategy, monitor their work, and communicate how a solution was obtained. Pajares and Miller (1994) showed that self-efficacy had a direct effect on mathematical problem-solving performance, distinguishing it from broader self-concept.

Research also indicates that problem-solving confidence can be supported through instruction. Simamora et al. (2019) found that guided discovery learning improved both mathematical problem solving and self-efficacy. Nurhasanah et al. (2024) likewise reported gains in numeracy and self-efficacy through project-based learning. These approaches create opportunities for learners to apply mathematical knowledge, receive feedback, and experience success in progressively challenging tasks.

In Southeast Asian and Philippine contexts, the relationship remains evident but may operate with other motivational variables. Thien and Ong (2015) found that mathematics self-efficacy significantly affected performance in both Malaysia and Singapore. Dagdag et al. (2021) reported that social persuasion predicted achievement in non-routine problem solving and related mathematical domains among prospective teachers. These findings imply that confidence-building practices should accompany explicit strategy instruction and contextualized problem solving.

Higher-Order Mathematical Reasoning

Higher-order mathematical reasoning involves analyzing multi-step problems, understanding algebraic relationships, drawing logical conclusions from numerical evidence, connecting new concepts with prior knowledge, and managing anxiety when tasks become complex. The OECD (2023) positioned reasoning as a central component of mathematical literacy because learners must formulate situations mathematically, evaluate solution strategies, and interpret results in context.

Self-efficacy is particularly important when tasks are difficult or unfamiliar. Street et al. (2022) found that the relationship between self-efficacy and performance varied according to perceived task difficulty. Herset et al. (2023) further showed that labeling identical tasks as difficult reduced students' self-efficacy. These results demonstrate that learners' perceptions of complexity can affect confidence before they begin solving a problem, potentially influencing effort and persistence.

Domain-specific studies also connect self-efficacy with reasoning performance. Chan et al. (2022) validated a measure of self-efficacy toward mathematical reasoning, while Simamora et al. (2019) documented improvements in both problem solving and self-efficacy through contextualized guided discovery. The literature therefore supports treating higher-order reasoning confidence as a distinct but related dimension of numeracy self-efficacy.

Mathematics Performance and the Local Research Gap

Mathematics performance is commonly measured through standardized assessments, achievement tests, or official grades. Grades reflect accumulated classroom performance and provide an accessible indicator of students' demonstrated learning. However, achievement is influenced by cognitive preparation, prior performance, instructional opportunities, motivation, anxiety, and self-regulation. Honicke and Broadbent (2016) concluded that academic self-efficacy is a consistent predictor of academic performance across educational settings.

Evidence from the Philippines is generally positive but not completely uniform. Cuevas and Berou (2016) and Dela Cruz and Dela Cruz (2022) reported positive relationships between mathematics self-efficacy and performance, whereas Peteros (2024) found no significant relationship in a blended-learning context. This variation shows that the strength of the relationship may depend on the population, educational level, measure of performance, and instructional environment.

Local studies from Bislig and nearby Caraga settings suggest that mathematics-related confidence has predictive value, yet direct studies involving secondary learners in Lingig remain limited (Apa & Antiquina, 2025; Cayetuna & Consigna, 2025; Lim & Paceño, 2026). Existing division initiatives focus strongly on assessment and remediation, but less attention has been given to the beliefs that may help explain why learners with similar opportunities perform differently. The present study addressed this contextual gap by examining whether numeracy self-efficacy predicted Mathematics grades among junior and senior high school students in Margarita K. Yusingco National High School.

Conceptual Framework

The study treated numeracy self-efficacy as the independent variable and mathematics performance as the dependent variable. Numeracy self-efficacy was represented by confidence in basic numeracy skills, problem-solving and application, and higher-order mathematical reasoning. Mathematics performance was represented by the students' Mathematics grade during the last grading period. The framework proposed that stronger confidence across the numeracy domains would be associated with and would significantly predict higher mathematics performance.

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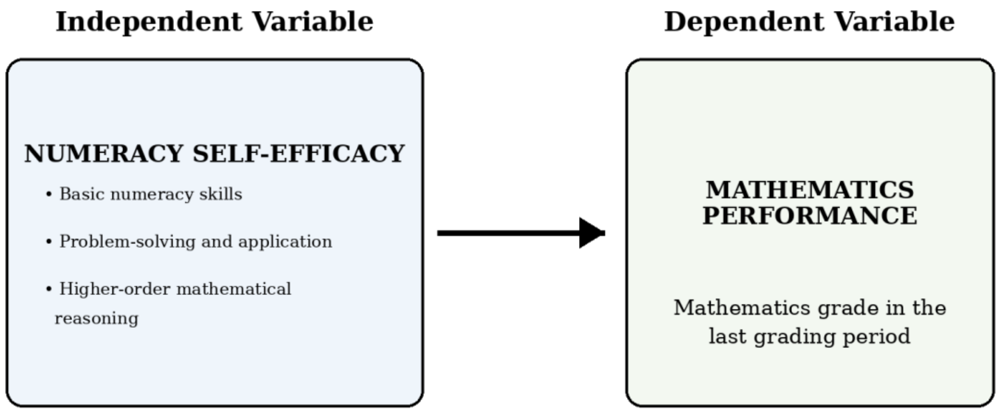

Figure 1. *Schematic Diagram of the Study*

METHODS

Research Design

The study employed a quantitative, non-experimental predictive-correlational research design. The descriptive component determined the levels of numeracy self-efficacy and mathematics performance, while the correlational component examined the direction and magnitude of their relationship. Simple linear regression was used to determine whether numeracy self-efficacy significantly predicted Mathematics grades. No variable was manipulated, and the analysis focused on naturally occurring differences among the respondents.

Research Locale

The study was conducted at Margarita K. Yusingco National High School in the Municipality of Lingig, Division of Surigao del Sur, Region XIII. The school is a public secondary institution that offers junior and senior high school programs and serves learners from geographically dispersed communities. Its participation in division-level numeracy assessment and intervention initiatives made it an appropriate setting for examining learner confidence and mathematics performance.

Participants and Sampling Technique

The population consisted of 216 Grade 9 to Grade 12 students enrolled during School Year 2025–2026. Using Slovin's formula at a 0.05 margin of error, a sample of 140 students was determined. Proportionate stratified random sampling was used to ensure representation from the junior and senior high school groups. The final sample included 83 junior high school students and 57 senior high school students. Respondents were randomly selected from official grade-level lists after the proportional allocation for each stratum had been established.

Table 1. *Distribution of Respondents*

School Level	Population	Sample
Junior High School	127	83
Senior High School	89	57
Total	216	140

Research Instrument

Data were collected using an adapted 15-item Numeracy Self-Efficacy Scale grounded in Bandura's self-efficacy framework and mathematics self-efficacy instruments such as that of Pajares and Miller (1994). The instrument contained three five-item domains: basic numeracy skills, problem-solving and application, and higher-order mathematical reasoning. Responses were rated on a five-point scale from 1 (Strongly Disagree) to 5

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(Strongly Agree). Domain and overall scores were interpreted as Very High (4.21–5.00), High (3.41–4.20), Moderate (2.61–3.40), Low (1.81–2.60), and Very Low (1.00–1.80).

The instrument underwent expert review for clarity, relevance, and alignment with the study variables, followed by pilot testing among students who were not included in the final sample. Internal consistency was evaluated using Cronbach's alpha, with a coefficient of at least 0.70 considered acceptable. Mathematics performance was measured using the students' official Mathematics grade from the last grading period, obtained from school records with authorization and consent.

Data Gathering Procedure

Permission to conduct the study was secured from the appropriate Schools Division and school authorities. The researcher oriented the respondents and their parents or guardians regarding the purpose, procedures, voluntary nature, and ethical safeguards of the study. After informed consent and assent were obtained, the Numeracy Self-Efficacy Scale was administered during an appropriate non-instructional period. Official Mathematics grades were subsequently retrieved from authorized school records. Completed questionnaires were checked, coded, and encoded for statistical analysis.

Data Analysis

Weighted means and standard deviations were used to describe numeracy self-efficacy in each domain. Frequency, percentage, mean, and standard deviation described Mathematics grades and their distribution across the Department of Education performance categories. Pearson product-moment correlation determined the relationship between numeracy self-efficacy and mathematics performance. Simple linear regression tested whether numeracy self-efficacy significantly predicted Mathematics grades and generated the unstandardized coefficient, standardized coefficient, coefficient of determination, F statistic, and probability value. All hypotheses were tested at the 0.05 level of significance. Descriptive analyses used the full sample of 140 respondents, while inferential analyses used 138 complete cases.

Ethical Consideration

The study observed voluntary participation, informed consent, student assent, confidentiality, and the right to withdraw without penalty. Parents or guardians were informed because the respondents were secondary school learners. No identifying information was reported in the manuscript, and grades were accessed only after authorization. Electronic and printed data were handled only for research purposes and were reported in aggregate form to protect the privacy of the participants.

RESULTS AND DISCUSSION

Confidence in Basic Numeracy Skills

Table 2. *Level of Confidence in Basic Numeracy Skills*

Basic Numeracy Skills	JHS WM	SD	VI	SHS WM	SD	VI
Add and subtract whole numbers accurately	4.01	1.28	High	4.16	1.00	High
Multiply and divide numbers without a calculator	3.95	1.18	High	3.91	0.85	High
Understand and compare fractions, decimals, and percentages	3.71	1.24	High	3.73	0.89	High
Solve problems involving ratio and proportion	3.43	1.30	High	3.58	0.98	High
Estimate quantities and round numbers appropriately	3.36	1.21	Moderate	3.54	0.89	High
Overall	3.69	1.26	High	3.78	0.95	High

Legend: 4.21–5.00 = Very High; 3.41–4.20 = High; 2.61–3.40 = Moderate; 1.81–2.60 = Low; 1.00–1.80 = Very Low.

Both groups demonstrated high confidence in basic numeracy skills. Junior high school students obtained an overall mean of 3.69 (SD = 1.26), while senior high school students obtained 3.78 (SD = 0.95). The highest-rated skill for both groups was adding and subtracting whole numbers accurately. This result suggests that

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frequently practiced operations provided strong mastery experiences, which Bandura (1997) identified as the most influential source of self-efficacy.

The comparatively weaker areas involved estimation, rounding, and proportional reasoning. Junior high school students rated estimation and rounding as Moderate (M = 3.36), while ratio and proportion received a relatively low High rating (M = 3.43). These skills require judgment, approximation, and relational thinking rather than direct application of familiar algorithms. Similar evidence from number-sense research indicates that self-efficacy is closely linked with learners' ability to interpret and reason with numbers (Santos et al., 2022).

The senior high school group reported slightly higher and more consistent confidence overall, although the differences were small. The pattern implies that instruction should retain regular practice in operations while providing more deliberate opportunities for estimation, proportional reasoning, and explanation of numerical reasonableness. Goal setting, graded practice, and immediate feedback may help extend confidence from routine calculation to flexible numeracy (Bandura & Schunk, 1981; Koponen et al., 2021).

Confidence in Problem-Solving and Application

Table 3. *Level of Confidence in Problem-Solving and Application*

Problem-Solving and Application	JHS WM	SD	VI	SHS WM	SD	VI
Solve word problems using the correct operations	3.81	1.18	High	3.81	0.74	High
Interpret data presented in tables, graphs, or charts	3.66	1.23	High	3.64	0.87	High
Apply mathematical formulas in practical problems	3.49	1.22	High	3.40	1.01	Moderate
Check work and identify calculation errors	3.84	1.15	High	3.75	1.24	High
Explain how an answer was obtained	3.66	1.21	High	3.68	0.90	High
Overall	3.69	1.20	High	3.66	0.97	High

Legend: 4.21–5.00 = Very High; 3.41–4.20 = High; 2.61–3.40 = Moderate; 1.81–2.60 = Low; 1.00–1.80 = Very Low.

Junior and senior high school students also reported high confidence in problem-solving and application, with overall means of 3.69 and 3.66, respectively. Both groups were most confident in solving word problems using the correct operations and in checking their work for errors. These results reflect confidence in structured problem-solving processes in which the required information and procedures are relatively identifiable.

Applying mathematical formulas in practical situations was the weakest indicator, particularly among senior high school students, whose mean of 3.40 was interpreted as Moderate. Interpreting data and explaining answers were also lower than the most procedural indicators. This pattern indicates that learners may feel more secure in obtaining an answer than in transferring mathematical knowledge, interpreting representations, or communicating their reasoning. Pajares and Miller (1994) emphasized that task-specific self-efficacy directly influences mathematical problem solving, especially when learners must coordinate several cognitive actions.

The findings support the use of contextualized tasks, multiple representations, and opportunities to explain solution processes. Guided discovery and project-based approaches have been shown to improve both mathematics performance and self-efficacy by allowing students to apply strategies, obtain feedback, and experience success in authentic tasks (Nurhasanah et al., 2024; Simamora et al., 2019).

Confidence in Higher-Order Mathematical Reasoning

Table 4. *Level of Confidence in Higher-Order Mathematical Reasoning*

Higher-Order Mathematical Reasoning	JHS WM	SD	VI	SHS WM	SD	VI
Understand algebraic expressions and equations	3.84	1.16	High	3.35	0.93	Moderate
Analyze and solve problems with multiple steps	3.60	1.26	High	3.54	1.04	High
Draw logical conclusions from numerical evidence	3.49	1.17	High	3.58	0.88	High
Connect new mathematical concepts with prior knowledge	3.53	1.06	High	3.46	0.70	High

Manage anxiety when facing complex mathematics problems	3.52	1.21	High	3.30	0.90	Moderate
Overall	3.60	1.18	High	3.45	0.90	High

Legend: 4.21–5.00 = Very High; 3.41–4.20 = High; 2.61–3.40 = Moderate; 1.81–2.60 = Low; 1.00–1.80 = Very Low.

Higher-order mathematical reasoning remained High in both groups, although the junior high school mean (3.60) was higher than the senior high school mean (3.45). Junior high school students were most confident in understanding algebraic expressions and equations, whereas senior high school students were most confident in drawing logical conclusions from numerical evidence. These differences may reflect variation in recent curricular exposure and in the complexity of tasks encountered at each level.

Senior high school students reported only Moderate confidence in algebraic expressions and in managing anxiety during complex problems. As learners advance, mathematical content becomes more abstract, and students may judge their capability more critically. Street et al. (2022) and Herset et al. (2023) showed that perceived difficulty influences mathematics self-efficacy, demonstrating that confidence can decline even when learners possess relevant knowledge.

The result highlights the need to integrate emotional regulation and reasoning support into mathematics instruction. Teachers can model thinking processes, break complex tasks into manageable phases, invite multiple solution strategies, and normalize productive struggle. Such practices may help learners develop confidence not only in reaching an answer but also in analyzing evidence, connecting ideas, and persisting through uncertainty.

Mathematics Performance

Table 5. *Mathematics Performance by School Level*

Group	N	Mean	SD	Interpretation
Junior High School	83	84.51	6.34	Satisfactory
Senior High School	57	83.96	6.69	Satisfactory
Overall	140	84.29	6.47	Satisfactory

Table 6. *Distribution of Mathematics Performance*

Performance Level	JHS f	%	SHS f	%	Total f	%
Outstanding (90–100)	22	26.51	15	26.32	37	26.43
Very Satisfactory (85–89)	20	24.10	14	24.56	34	24.29
Satisfactory (80–84)	21	25.30	8	14.04	29	20.71
Fairly Satisfactory (75–79)	15	18.07	16	28.07	31	22.14
Did Not Meet Expectations (below 75)	5	6.02	4	7.02	9	6.43
Total	83	100.00	57	100.00	140	100.00

The respondents' overall Mathematics grade was 84.29 (SD = 6.47), interpreted as Satisfactory. Junior high school students obtained a mean of 84.51, while senior high school students obtained 83.96. The difference between the group means was small, indicating broadly comparable performance across the two school levels.

More than half of the respondents were classified as Outstanding or Very Satisfactory, but 22.14% were Fairly Satisfactory and 6.43% did not meet expectations. The distribution therefore shows both achievement strengths and a continuing need for targeted assistance. Confidence-building strategies should not replace direct instruction or remediation; rather, they should be integrated with diagnostic assessment, explicit teaching, and practice designed around the specific skills students have not yet mastered.

Relationship and Predictive Influence of Numeracy Self-Efficacy

Table 7. *Correlation and Regression Results*

Analysis	Statistic	Value	p-value	Decision
Pearson correlation	n; r	138; .857	< .001	Reject H_{01}
Regression coefficient	B; β; t	7.10; .857; 19.40	< .001	Significant predictor
Model summary	R; R^2; F(1,136)	.857; .734; 376.21	< .001	Reject H_{02}

Numeracy self-efficacy had a very strong positive and statistically significant relationship with mathematics performance, $r = .857$, $p < .001$. Thus, learners who reported stronger confidence across the numeracy domains tended to obtain higher Mathematics grades. The result is consistent with studies showing that task-specific mathematics self-efficacy is closely associated with achievement and problem-solving performance (Pajares & Graham, 1999; Yang et al., 2024).

Simple linear regression further showed that numeracy self-efficacy significantly predicted mathematics performance, $F(1, 136) = 376.21$, $p < .001$. The coefficient of determination, $R^2 = .734$, indicated that numeracy self-efficacy explained 73.4% of the variance in Mathematics grades among the complete cases. The regression equation was Mathematics Grade = 63.23 + 7.10(Numeracy Self-Efficacy), meaning that a one-unit increase in the self-efficacy score was associated with an estimated 7.10-point increase in Mathematics grade.

The magnitude of the relationship indicates that confidence was a highly consequential learner variable in this school context. Nevertheless, the result should be interpreted as prediction rather than proof of causation because the study was non-experimental. Mathematics performance can also be influenced by prior knowledge, teaching quality, attendance, family support, access to resources, and other factors not included in the model. Even so, the strong predictive result provides a compelling basis for integrating self-efficacy supports into numeracy intervention and everyday classroom practice.

The findings support mastery-oriented instruction that provides attainable challenges, explicit strategy modeling, guided practice, timely feedback, peer examples, and opportunities for learners to reflect on successful performance. Zakariya (2022) concluded that mathematics self-efficacy can be improved through instructional and learning-strategy interventions. In the present context, confidence-building should be directed especially toward estimation, practical application of formulas, algebraic reasoning, and anxiety management during complex tasks.

CONCLUSION

The study established that junior and senior high school students generally possessed high numeracy self-efficacy in basic numeracy skills, problem-solving and application, and higher-order mathematical reasoning. Their strongest confidence was observed in familiar operations, structured word problems, and checking calculations, while comparatively weaker confidence appeared in estimation, practical formula application, algebraic understanding among senior high school students, and anxiety management during complex mathematics tasks.

The respondents' mathematics performance was generally Satisfactory, although the distribution included learners at both high and low achievement levels. Numeracy self-efficacy was very strongly and positively related to Mathematics grades and significantly predicted performance. The model explained a substantial proportion of the variance, showing that learners' beliefs in their capability to perform numeracy tasks were closely connected with their demonstrated mathematics outcomes.

The study contributes localized evidence that numeracy development involves both competence and confidence. Strengthening students' self-efficacy should therefore be treated as a complementary component of mathematics instruction and intervention. Because the design was predictive-correlational, the findings do not establish causality and are most appropriately applied to the school population and similar contexts.

Recommendation

Mathematics teachers should use mastery-oriented and confidence-sensitive instruction by sequencing tasks from accessible to challenging, modeling strategies, providing guided practice, and giving specific feedback that links improvement to effort and effective strategy use. Greater instructional attention should be given to estimation, proportional reasoning, practical use of formulas, algebraic understanding, interpretation of numerical evidence, and management of anxiety during complex tasks.

School administrators and mathematics coordinators should incorporate self-efficacy indicators into school-based numeracy programs, diagnostic activities, and intervention planning. Results from Mathematics grades and assessments may be reviewed together with learners' confidence profiles so that remediation addresses both skill gaps and avoidance or low confidence. Peer tutoring, mathematics clinics, contextualized activities, and recognition of progress may support this purpose.

Parents and guardians should be encouraged to provide constructive support, avoid messages that portray mathematics ability as fixed, and recognize persistence and improvement rather than only correct answers. Learners should be given opportunities to monitor their progress, reflect on successful strategies, ask for help, and practice mathematics in meaningful home and community situations.

Future researchers should replicate the study with larger and more diverse samples, use longitudinal or experimental designs, and examine additional predictors such as mathematics anxiety, prior achievement, study habits, teaching practices, parental support, and socioeconomic conditions. Subsequent studies may also validate the Numeracy Self-Efficacy Scale more extensively and investigate whether targeted self-efficacy interventions produce measurable improvements in mathematics achievement.

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